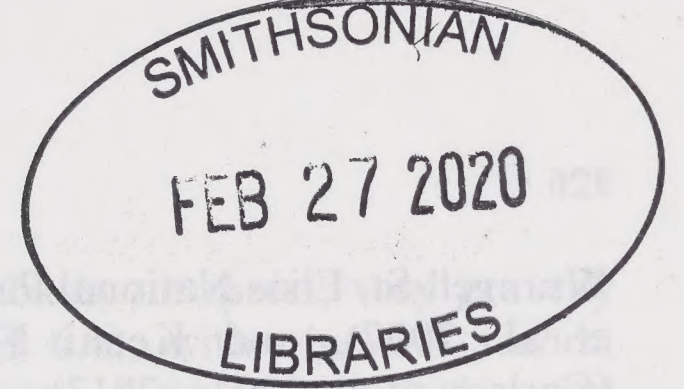




NOTEWORTHY COLLECTION

ALASKA

CAREX ECHINATA Murr. subsp. *ECHINATA* (CYPERACEAE). Lake and Peninsula Borough, Katmai National Park and Preserve (KATM), Kukak Bay, 58.34°, -154.18° (WGS84; detailed coordinates withheld, taxon is on Alaska rare plant list), 32 m, 15 July 2017, M. J. Macander with T. Christopherson, S. L. Ives, and A. F. Wells (ALA V177883). Uncommon in a wetland on a small coastal peninsula, growing on organic soils (pH 5.9) with *Calamagrostis canadensis* (Michx.) P.Beauv., *Carex lyngbyei* Hornem., *Carex tenuiflora* Wahlenb., *Equisetum fluviatile* L., and *Eriophorum viridicarinatum* (Engelm.) Fernald.

Previous knowledge. *Carex echinata* subsp. *echinata* has an Alaska state rare ranking of S1S2 and a global rare ranking of G5T5 (ACCS 2019). A state ranking of S1S2 means this subspecies is considered critically imperiled to imperiled within Alaska and is at risk of extirpation because of very few occurrences and limited range extent. A global ranking of G5T5 means this subspecies is considered secure (common, widespread, and abundant) globally. This taxon is widespread elsewhere in North America; it occurs in eight Canadian provinces; and in 35 U.S. states (Ball and Reznicek 2003). Outside of North America, this species is known from Eurasia. There are 11 previous records of this subspecies in Alaska. Four records come from the Skwentna River drainage in south-central Alaska, one from the eastern Alaska Range near the community of Paxon, four from the Aleutian Islands (Unalaska Island), and two from the central Alaska Range in Denali National Park and Preserve (Roland 2004; ACCS 2019; ARCTOS 2019; CPNWH 2019; IRMA 2019). See Carlson et al. (2013) for additional discussion of this taxon in southwestern Alaska and Carlson and Heitz (2018) for floristic patterns in southwestern Alaska.

Significance. This is the first record of subsp. *echinata* on the Alaska Peninsula and in KATM.

CAREX LAPPONICA O.F.Lang (CYPERACEAE). Lake and Peninsula Borough, KATM, Douglas River valley, 58.87°, -153.86° (WGS84; detailed coordinates withheld, taxon is on Alaska rare plant list), 91 m, 13 July 2017, S. L. Ives with A. F. Wells (ALA V177884). Common in a beaver dam wetland complex; soils wet, silty clay loam over loamy very fine sand (pH 6.1), growing with *Arctophila fulva* (Trin.) Anderss., *Carex canescens* L., *Carex utriculata* F.Boott, and *Juncus filiformis* L.

Previous knowledge. *Carex lapponica* has an Alaska state rare ranking of S3S4 and a global rare ranking of G4G5 (ACCS 2019). A state ranking of

S3S4 means this species is rare to apparently secure, but uncommon within the state. A global ranking of G4G5 means this species is apparently secure globally. This taxon is known to occur in North America in seven Canadian provinces, and in the U.S. only in Alaska. Outside of North America, this species is known from northern Eurasia (Ball and Reznicek 2003). There are 33 previous records of this species in the state (ACCS 2019; ARCTOS 2019; CPNWH 2019). Records of this species are widely scattered in Alaska south of the Brooks Range, excluding the Aleutian Island and the Alexander Archipelago. Previous accounts of this species on National Parklands in Alaska include: Denali National Park and Preserve (Roland 2004), Yukon-Charley Rivers National Preserve (Roland et al. 2004), Gates of the Arctic National Park and Preserve and Kobuk Valley National Park (Parker 2006), and Wrangell-St. Elias National Park and Preserve (Cook et al. 2007).

Significance. This is the first record of this rare species on the Alaska Peninsula, and the first record in KATM.

CAREX PHAEOCEPHALA Piper (Cyperaceae). Lake and Peninsula Borough, KATM, near the foot of Hallo Glacier, 58.41°, -154.17° (WGS84; detailed coordinates withheld, taxon is on Alaska rare plant list), 43 m, 16 July 2017, S. L. Ives with A. F. Wells (NPS Museum Collection KATM-00652 Cat. #55024). Uncommon on partially vegetated, recently deglaciated, glaciofluvial deposits; soils dry, extremely gravelly sand over fine sand (pH 7.1). Growing with *Alnus viridis* ssp. *sinuata* (Regel) Á.Löve & D.Löve, *Poa arctica* R.Br., *Racomitrium ericoides* (Web. ex Brid.) Brid., *Salix alaxensis* (Andersson) Coville, and *S. sitchensis* Sanson ex Bong.

Previous knowledge. *Carex phaeocephala* has an Alaska state rare ranking of S3 and global rare ranking of G4 (ACCS 2019). A state ranking of S3 means this species is rare in Alaska and at moderate risk of extirpation. A global rare ranking of G4 means this species is secure, but uncommon globally, and there is some cause for long-term concern. This taxon is known to occur in North America in three western Canadian provinces and 10 U.S. states (Ball and Reznicek 2003; CPNWH 2019). There are 36 previous records of this species in Alaska (ACCS 2019; ARCTOS 2019; CPNWH 2019). Records are concentrated in rocky alpine and deglaciated habitats in the Chugach, Kenai, St. Elias, and western Alaska Range, the Aleutian Range mountains, and mountains of southeast Alaska. Previous accounts of this species on National Parklands in Alaska include: Denali National Park and Preserve (Roland 2004),

Wrangell-St. Elias National Park and Preserve (Cook et al. 2007), and Kenai Fjords National Park (Carlson et al. 2004a, 2013).

Significance. This is the furthest southwest record of this species in Alaska, and the first record in KATM.

DRABA ALEUTICA Ekman (BRASSICACEAE). Lake and Peninsula Borough, KATM, Aleutian Range near headwaters of Kejulik River, 58.07°, -155.46° (WGS84; detailed coordinates withheld, taxon is on Alaska rare plant list), 925 m, 12 July 2017, *S. L. Ives with A. F. Wells* (ALA V177880). Rare on a partially vegetated, alpine mountain summit; soils dry, flagstones over sandy clay loam (pH 7.2). Growing with *Carex microchaeta* ssp. *nesophila* (T.Holm) A.E.Murray, *Cerastium beer- ingianum* Cham. & Schltldl., *Geum glaciale* Adams ex Fisch. & C.A.Mey., *Potentilla hyparctica* Malte, and *Salix rotundifolia* Trautv.

Previous knowledge. *Draba aleutica* has an Alaska state rare ranking of S2 and global rare ranking of G2 (ACCS 2019). Thus this species is considered imperiled within the state. This taxon is known to occur in Yukon and Alaska (Al-Shehbaz et al. 2010; CPNWH 2019). There are 13 previous records of this species in Alaska (ACCS 2019; ARCTOS 2019; CPNWH 2019). Ten are from the Aleutian archipelago, one from St. Paul Island, one from the east side of the Alaska Peninsula approximately 60 km south of Becharof Lake, and one from the Charley River headwaters in Yukon-Charley Rivers National Preserve.

Significance. This is the second record of this rare species on the Alaska Peninsula, and the first record in KATM. This population adds to our understanding of a species with an unusual distribution, and with substantial gaps in occurrences.

ERIOPHORUM VIRIDICARINATUM (Engelm.) Fernald (CYPERACEAE). Two collections in Lake and Peninsula Borough, KATM. First collection at Kukak Bay, 58.34°, -154.18° (WGS84; detailed coordinates withheld, taxon is on Alaska rare plant list), 32 m, 15 July 2017, *M. J. Macander with T. Christopherson, S. L. Ives, and A. F. Wells* (ALA V177885). Uncommon in a wetland on a small coastal peninsula, growing on organic soils (pH 5.9) with *Calamagrostis canadensis*, *Carex echinata* subsp. *echinata*, *Carex lyngbyei*, *Carex tenuiflora*, and *Equisetum fluviatile*. Second collection in Walatka Mountains approximately 14.5 km east of Lake Grosvenor, N 58.68°, E -154.94°, 841 m elevation, 19 August 2017, *S. L. Ives with A. F. Wells* (ALA V177886). Rare in a small wetland formed by a groundwater spring, soils of volcanic ash (pH 6.0), with *Arctagrostis latifolia* (R.Br.) Griseb., *Carex aquatilis* Wahlenb., *Carex lachenalii* Schkuhr, *Eriophorum scheuchzeri* Hoppe, and *Saxifraga rivularis* L.

Previous knowledge. *Eriophorum viridicarinatum* has an Alaska state rare ranking of S2S3 and a global rare ranking of G5 (ACCS 2019). This species is widespread in North America, occurring in 11 Canadian provinces and 20 U.S. States (Ball and Wujek 2003). In Alaska, there are 22 previous records of this species. Records are concentrated in wetlands of south-central Alaska and Kodiak Island, but also extend as far north as the southern Brooks Range, as far west as Nunivak Island, and to Chichagof and Mitkof Islands in Southeast Alaska (ACCS 2019; CPNWH 2019; ARCTOS 2019). Previous accounts of this species on National Parklands in Alaska include: Gates of the Arctic National Park and Preserve (Parker 2006), Glacier Bay National Park and Preserve (Carlson et al. 2004b), Denali National Park and Preserve (Roland 2004; Carlson et al. 2013), Wrangell-St. Elias National Park and Preserve (Cook and Roland 2002; Cook et al. 2007), and Yukon-Charley Rivers National Preserve (Roland et al. 2004).

Significance. These are the first records of this rare taxon from the Alaska Peninsula, and the first records in KATM. These populations fill a gap between the disjunct populations on Kodiak and Nunivak Islands.

LIMOSELLA AQUATICA L. (SCROPHULARIACEAE). Lake and Peninsula Borough, KATM, near the eastern shore of Kukaklek Lake, 59.18°, -155.16° (WGS84; detailed coordinates withheld, taxon is on Alaska rare plant list), 249 m, 18 August 2017, *A. F. Wells with S. L. Ives* (NPS Museum Collection KATM-00652 Cat. #55647). Rare in a barren, recently drained lake basin; soils wet, extremely gravelly loamy fine sand (pH 6.1). Growing with *Agrostis scabra* Willd., *Carex buxbaumii* Wahlenb., *Callitriche palustris* L., *Koenigia islandica* L., and *Subularia aquatica* L.

Previous knowledge. *Limosella aquatica* has an Alaska state rare ranking of S3 and global rare ranking of G5 (ACCS 2019). This taxon is known to occur in North America in Greenland, four Canadian provinces, and in nine U.S. States (ARCTOS 2019; CPNWH 2019). In Eurasia, this species is known from eastern Russia. There are 27 previous records of this species from Alaska that have location information associated with voucher specimens (ACCS 2019; ARCTOS 2019, CPNWH 2019). Records of this species in Alaska are scattered south of the Yukon River from the Alaska Range, Alaska Peninsula, Bristol Bay region, lower Kuskokwim River watershed, Kodiak Archipelago, and the north Gulf coast. Previous accounts of this species on National Parklands in Alaska include: KATM and Alagnak Wild River (Carlson and Lipkin 2003; Carlson et al. 2013), Aniakchak National Monument and Preserve (Lipkin 2005; Carlson et al. 2013), Denali National Park and Preserve (Roland 2004), Lake Clark National Park and Preserve (ACCS

2019), and Wrangell-St. Elias National Park and Preserve (Cook et al. 2007).

Significance. This is the second record of this rare species in KATM.

PRIMULA TSCHUKTSCHORUM Kjellm. (PRIMULACEAE). Lake and Peninsula Borough, KATM, approximately 4 km northwest of the outlet of Mirror Lake, 59.27°, -154.82° (WGS84; detailed coordinates withheld, taxon is on Alaska rare plant list), 501 m, 26 August 2017, G.V.Frost with S. L. Ives and R.W. McNown (NPS Museum Collection KATM-00652 Cat. #55601). Rare in an alpine wet sedge meadow; soils wet, organic over very cobbly till (pH 6.1), growing with *Carex aquatilis*, and *Carex rotundata* Wahlenb., *Eriophorum angustifolium* Honck., *Sarmenthyllum sarmentosum* (Wahlenb.) Tuom. & T. Kop., and *Sphagnum lindbergii* Schimp.

Previous knowledge. *Primula tschuktschorum* has an Alaska state rare ranking of S3 and global rare ranking of G2G3 (ACCS 2019). A state ranking of S3 means this species is rare within the state and at moderate risk of extirpation. A global ranking of G2G3 is suggestive of a moderate level of vulnerability at the global level. As the subnational rank was increased to a rank greater than the global rank, the global rank will increase to the minimum subnational rank (G3 in this case). This taxon is known to occur in North America only in Alaska (Kelso 2009; CPNWH 2019). Outside of North America, this species is known from eastern Russia in the Bering Strait region (ARCTOS 2019). There are 82 previous records of this species in Alaska all from the Bering and southern Chukchi Sea regions, and northern Alaska Peninsula (ACCS 2019; ARCTOS 2019; CPNWH 2019). Records of this taxon are concentrated on the Seward Peninsula, the Ahklun and Wood River Mountains, the northern Alaska Peninsula, Cape Lisburne, and several islands in the Bering Sea: Nunivak, St. George, St. Matthew, and St. Lawrence. Previous accounts of this species on National Parklands in Alaska include: Bering Land Bridge National Preserve (Parker 2006) and KATM (Carlson and Lipkin 2003; Carlson et al. 2013). The taxonomy and identification of this taxon has been inconsistent; furthermore *P. tschuktschorum* is known to hybridize with *P. eximia* Greene (Carlson et al. 2008), making descriptions of its distribution problematic.

Significance. This is the third record of this rare species in KATM and at the southern edge of its range.

GNAPHALIUM ULIGINOSUM L. (ASTERACEAE). Lake and Peninsula Borough, KATM, approximately 1.6 km south of the southern shore of Kukaklek Lake, 59.11287°, -155.28563° (WGS84), 341 m, 15 August 2017, S. L. Ives with A. F. Wells (ALA V177887). Uncommon in a partially vegetated,

recently drained lake basin on moist, very gravelly sandy loam soils (pH 6.1), with *Agrostis scabra*, *Carex kelloggii* W.Boott, *Carex saxatilis* L., and *Deschampsia cespitosa* (L.) P.Beauv.

Previous knowledge. *Gnaphalium uliginosum* is native to Europe, and is presently known to occur in North America in 12 Canadian provinces, and in 29 U.S. states (Nesom 2006). This species is generally considered non-native to North America; however, it is unclear if some or all of the North American plants were introduced (Nesom 2006). *Gnaphalium uliginosum* is considered non-native in Alaska (AKEPIC 2019). The earliest known records in Alaska are from Fairbanks in 1931 and the village of Takotna in 1941 (CPNWH 2019). There are 19 previous records, ranging from as far south as Prince of Wales Island in Southeast Alaska to as far north as Minto Flats, and as far west as the Togiak River, approximately 26 km upstream of the village of Togiak. In KATM, a likely vector for propagules is fly-in fishing operations, which are common in this part of the park during summer.

Significance. This represents the first record on the west side of the Aleutian Range on the Alaska Peninsula, is the first record in KATM, and is one of the few non-native plants established in areas away from human development in the state.

PHLEUM PRATENSE L. (POACEAE). Lake and Peninsula Borough, on an exposed headland at Cape Atushagvik, 58.08333°, -154.31872° (WGS84), 3 m, 17 July 2017, M. J. Macander with T. Christopherson (NPS Museum Collection KATM-00652 Cat. #55404). Uncommon in a moist meadow; soils organic over gravelly coarse sand (pH 4.7), with *Angelica genuflexa* Nutt., *Empetrum nigrum* L., *Carex macrochaeta* C.A.Mey., *Chamaepericlymenum suecicum* (L.) Asch. & Graebn., and *Viola langsдорffii* Fisch. ex Ging.

Previous knowledge. *Phleum pratense* is native to Europe and is considered non-native in North America, where it is presently known to occur in all Canadian provinces except Prince Edward Island and Labrador, and in all 50 U.S. States (Esser 1993). Carlson and Shephard (2007) developed an invasiveness ranking system for Alaska, which ranks non-native species on a scale from 0 (no threat to native ecosystems) to 100 (major threat). *Phleum pratense* has been assigned an invasiveness ranking of 54, indicating it represents a moderate threat to native ecosystems. Previously known records in Alaska occur from as far south as Prince of Wales Island in Southeast Alaska, to as far north as Fairbanks, and as far west as Nome (AKEPIC 2019; ARCTOS 2019; CPNWH 2019). This species is also known from Unalaska Island in the Aleutian archipelago. NPS IRMA (2019) reports that this non-native species occurs in the following National Parks in Alaska: Glacier Bay National Park and Preserve,

KATM, Kenai Fjords National Park, Klondike Gold Rush National Historical Park, Kobuk Valley National Park, Lake Clark National Park and Preserve, Sitka National Historical Park, Wrangell-St. Elias National Park and Preserve, and Yukon-Charley Rivers National Preserve.

The presence of this non-native species in such a remote location is somewhat puzzling. One possible vector is seeds attached to the fur of bears traveling to and from Hallo Bay and Geographic Harbor, popular bear viewing areas along the KATM coast. This grass has a long history as a pasture grass in Alaska, including at a few remote locations, hence the source could be from an abandoned homestead (M. L. Carlson, University of Alaska, Anchorage, personal communication). For example, *P. pratense* was encountered in 2005 on the far eastern end of Tustumena Lake at an old cabin site near Glacier Creek (AKEPIC 2019). However, while a large pre-contact village occupied Cape Atushagvik until ca. AD 1300, no homesteads are known from the area (K. Meyers, U.S. National Park Service, Anchorage, AK, personal communication). In the early 1900s explorers and scientists in the Katmai region, many of whom used horses, may have transported *P. pratense* to the area on their way to the Valley of 10,000 Smokes. However, most began their journey from Katmai Bay, or further south at the village of Kanatak (Hildreth and Fierstein 2012), and it seems unlikely any would have passed by Cape Atushagvik, an approximate 80 km trek across a rugged coastline from Katmai Bay. Horses are another possible vector for propagules of *P. pratense*. In 1956, a barge carrying 16 horses from Kodiak to Puale Bay in rough seas began taking on water (Clemens and Norris 1999). The skipper pulled into nearby Amalik Bay, unloaded the horses, and went back to Kodiak. The horses eventually scattered, and all but one of them died within six months. The surviving horse, a bay gelding, was spotted each year by fishermen and pilots for the next 18 years until a fisherman found its carcass in 1974, surrounded by wolf tracks.

Significance. This represents the first confirmed specimen record of this species in KATM, and the only specimen on the Shelikof Strait side of the Alaska Peninsula. A number of records are known from the Bristol Bay side of the peninsula at the settlement of King Salmon, less than 10 km west of the KATM Park boundary (AKEPIC 2019).

PERSICARIA LAPATHIFOLIA (L.) Gray (POLYGONACEAE). Lake and Peninsula Borough, KATM, on a sand bar of an unnamed river that flows into the south end of Brooks Lake, 58.43182°, -156.17244° (WGS84), 34 m, 18 August 2016, E. K. Johnson with T. Christopherson (NPS Museum Collection KATM-00652 Cat. #54535). Rare in a willow thicket; soils very fine sandy loam over extremely gravelly coarse sand (pH 6.1), with *Calamagrostis canadensis*,

Equisetum arvense L., and *Polygonum aviculare* L., *Salix alaxensis*, and *Salix barclayi* Andersson.

Previous knowledge. *Persicaria lapathifolium* is native to North America, but is considered non-native in Alaska (Hultén 1968, Welsh 1974), and has been assigned an invasiveness ranking of 47, indicating it represents a moderate threat to native ecosystems (AKEPIC 2019). This taxon is presently known to occur in North America in Greenland, in 13 Canadian provinces, and in all 50 U.S. states (Hinds and Freeman 2005). Globally, this taxon is known to occur in Mexico, South America, Europe, Asia, Africa, and New Zealand. Previously known records in Alaska extend from as far south as Juneau in Southeast Alaska, to as far north as the Kobuk River in Kobuk Valley National Park, and as far west as the Innoko River (ARCTOS 2019; CPNWH 2019). This species is also known from Kodiak Island in the Gulf of Alaska. NPS IRMA (2019) reports, and specimen records confirm, that this species occurs in the following National Parks in Alaska: Denali National Park and Preserve, KATM, Kobuk Valley National Park, Lake Clark National Park and Preserve, and Yukon-Charley Rivers National Preserve.

Significance. This represents the second record of this non-native species in KATM, and it is the most southerly record on the Alaska Peninsula.

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LITERATURE CITED

- AL-SHEHBAZ, I. A., M. D. WINDHAM, AND R. ELVEN. 2010. *Draba*. Pp. 269–271 in: Flora of North America Editorial Committee (eds.), Flora of North America North of Mexico, Vol. 7: please include the volume name here. Oxford University Press, New York, NY.
- ALASKA CENTER FOR CONSERVATION SCIENCE (ACCS). 2019. Rare Plant Data Portal. University of Alaska, Anchorage, AK. Website: <http://aknhp.uaa.alaska.edu/apps/rareplants> [accessed 04 February 2019].
- ALASKA EXOTIC PLANT INFORMATION CLEARINGHOUSE DATABASE (AKEPIC). 2019. Alaska Center for Conservation Science, University of Alaska, Anchorage, AK. Website: <http://accs.uaa.alaska.edu/invasive-species/non-native-plants> [accessed 03 February 2019].

- ARCTOS. 2019. Collaborative Collection Management Solution. ARCTOS Working Group. Website: <https://arctos.database.museum/> [accessed 04 February 2019].
- BALL, P. W. AND A. A. REZNICEK. 2003. *Carex*. Pp. 254–258 in: Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 20+ vols. Vol 23, Oxford University Press, New York, NY.
- BALL, P. W. AND D. E. WUJEK. 2003. *Eriophorum*. Pp. 21 in: Flora of North America Editorial Committee (eds.), Flora of North America North of Mexico. Vol. 23: please include name of volume. Oxford University Press, New York, NY.
- CARLSON, M. L. AND B. HEITZ. 2018. Flora of Bristol Bay. Pp. 49–60 in C. A. Woody (ed.). The globally significant natural resources of Bristol Bay, Alaska. J. Ross Publishing, Fort Lauderdale, FL.
- CARLSON, M. L. AND R. LIPKIN. 2003. Alagnak Wild River and Katmai National Park vascular plant inventory. Annual technical report. Cooperative Agreement between National Park Service Alaska Region Inventory and Monitoring Program, Alaska Natural Heritage Program, University of Alaska, Anchorage, AK.
- CARLSON, M. L. AND M. SHEPHARD. 2007. The spread of invasive exotic plants in Alaska: is establishment of exotics accelerating? T. B. Harrington and S.H. Reichard (tech. eds.). Meeting the challenge: invasive plants in Pacific Northwestern ecosystems. USDA Forest Service, Pacific Northwest Research Station, Gen. Tech. Rep. PNW-GTR-694.
- CARLSON, M.L., S.D. GISLER, AND S. KELSO. 2008. The role of reproductive assurance in the Arctic: a comparative study of a homostylous and distylous species pair. Arctic, Antarctic, and Alpine Research 40:39–47.
- CARLSON, M. L., K. BOGGS, R. LIPKIN, AND J. MICHAELSON. 2004b. Glacier Bay National Park and Preserve vascular plant inventory. Final technical report. Cooperative agreement between National Park Service Alaska Region Inventory and Monitoring Program and Alaska Natural Heritage Program, University of Alaska, Anchorage, AK.
- CARLSON, M. L., R. LIPKIN, C. ROLAND, AND A.E. MILLER. 2013. New and important vascular plant collections from south-central and southwestern Alaska: a region of floristic convergence. Rhodora 115:61–95.
- CARLSON, M. L., R. LIPKIN, M. STURDY, AND J. MICHAELSON. 2004a. Kenai Fjords National Park vascular plant inventory. Final technical report: NPS/AKR/SWAN/NRTR-2004/02. Cooperative Agreement between National Park Service Alaska Region Inventory and Monitoring Program, Alaska Natural Heritage Program, University of Alaska, Anchorage, AK.
- CLEMENS, J. AND F. B. NORRIS. 1999. Building in an ashen land: Katmai National Park and Preserve: historic resource study. National Park Service, Alaska Support Office. Anchorage, AK.
- CONSORTIUM OF PACIFIC NORTHWEST HERBARIA SPECIMEN DATABASE (CPNWH). 2019. Website: <http://www.pnwherbaria.org> [accessed 19 September 2019].
- COOK, M. B. AND C. A. ROLAND. 2002. Notable vascular plants from Alaska in Wrangell-St. Elias National Park and Preserve with comments on the floristics. Canadian Field Naturalist 116:192–304.
- COOK, M. B., C. A. ROLAND, AND P. A. LOOMIS. 2007. An inventory of the vascular flora Wrangell-St. Elias National Park and Preserve, Alaska. Natural resource technical report NPS/CAKN/NRTR—2007/067. National Park Service. Central Alaska Network, Inventory and Monitoring Program, Fairbanks, AK.
- ESSER, L. L. 1993. *Phleum pratense*. Fire effects information system. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Website: <https://www.fs.fed.us/database/feis/plants/graminoid/phlpra/all.html> [accessed 03 February 2019].
- HILDRETH, W. AND J. FIERSTEIN. 2012. The Novarupta-Katmai eruption of 1912—largest eruption of the twentieth century: centennial perspectives: U.S. Geological Survey Professional Paper 1791.
- HINDS, H. R. AND C. C. FREEMAN. 2005. *Persicaria*. Pp. 574 in: Flora of North America editorial committee, eds. 1993+. Flora of North America North of Mexico. 20+ vols. New York and Oxford. Vol. 5,
- HULTÉN, E. 1968. Flora of Alaska and neighboring territories. Stanford University Press, Stanford, CA.
- KELSO, S. 2009. *Primula*. Pp. 286–289 in: Flora of North America editorial committee (eds.). Flora of North America North of Mexico. Vol. 8: please include name of the volume here. Oxford University Press, New York, NY.
- LIPKIN, R. 2005. Aniakchak National Monument and Preserve vascular plant inventory. Final technical report NPS/AKR/SWAN/NRTR-2005/06. Cooperative Agreement between National Park Service Alaska Region Inventory and Monitoring Program, Alaska Natural Heritage Program, University of Alaska Anchorage, AK.
- NATIONAL PARK SERVICE (NPS) INTEGRATED RESOURCE MANAGEMENT APPLICATIONS PORTAL (IRMA). 2019. Website: <https://irma.nps.gov> [accessed 04 February 2019].
- NESOM, G. L. 2006. *Gnaphalium*. Pp. 428–429 in: Flora of North America Editorial Committee (eds.), Flora of North America North of Mexico. Vol. 19, 20, and 21: please include volume names. Oxford University Press, New York, NY.
- PARKER, C. L. 2006. Vascular plant inventory of Alaska's Arctic National Parklands. Final Report to the National Park Service, Report Number Report Number: NPS/AKRARC/NRTR-2006/01. Arctic Network Inventory and Monitoring Program, Fairbanks, AK.
- ROLAND, C. A. 2004. The vascular plant floristics of Denali National Park and Preserve: a summary, including the results of plant inventory fieldwork 1998–2001. Final technical report CAKN-04-01. National Park Service. Central Alaska Network, Inventory and Monitoring Program, Fairbanks, AK.
- ROLAND, C. A., M. B. COOK, A. LARSEN, AND C. RECTOR. 2004. Results of an inventory of the vascular plants of Yukon-Charley Rivers National Preserve. Final technical report CAKN-04-02. National Park Service. Central Alaska Network, Inventory and Monitoring Program, Fairbanks, AK.
- WELSH, S. L. 1974. Anderson's flora of Alaska and adjacent parts of Canada. Brigham Young University Press, Provo, UT.